



SEQUENCE LISTING

<110> WAKITA, Takaji
KATO, Takanobu
DATE, Tomoko

<120> A NUCLEIC ACID CONSTRUCT CONTAINING A NUCLEIC ACID DERIVED
FROM THE GENOME OF HEPATITIS C VIRUS (HCV) OF GENOTYPE 2a,
AND A CELL HAVING SUCH NUCLEIC ACID CONSTRUCT INTRODUCED THEREIN

<130> 1254-0299PUS1

<140> US 10/558,155
<141> 2005-11-23

<150> PCT/JP2003/015038
<151> 2003-11-25

<150> JP 2003-148242
<151> 2003-05-26

<150> JP 2003-329115
<151> 2003-09-19

<160> 41

<170> PatentIn Ver. 2.1

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Leu Ala Gly Leu Arg Gly Pro Val Thr Gln Met Tyr Ser Ser Ala Glu																				
1095 1100 1105																				
ggg gac ttg gta ggc tgg ccc agc ccc cct ggg acc aag tct ttg gag	3715																			
Gly Asp Leu Val Gly Trp Pro Ser Pro Pro Gly Thr Lys Ser Leu Glu																				
1110 1115 1120 1125																				
ccg tgc aag tgt gga gcc gtc gac cta tat ctg gtc acg cgg aac gct	3763																			
Pro Cys Lys Cys Gly Ala Val Asp Leu Tyr Leu Val Thr Arg Asn Ala																				
1130 1135 1140																				

gat gtc atc ccg gct cgg aga cgc ggg gac aag cgg gga gca ttg ctc	3811
Asp Val Ile Pro Ala Arg Arg Arg Gly Asp Lys Arg Gly Ala Leu Leu	
1145 1150 1155	
tcc ccg aga ccc att tcg acc ttg aag ggg tcc tcg ggg ggg ccg gtg	3859
Ser Pro Arg Pro Ile Ser Thr Leu Lys Gly Ser Ser Gly Gly Pro Val	
1160 1165 1170	
ctc tgc cct agg ggc cac gtc gtt ggg ctc ttc cga gca gct gtg tgc	3907
Leu Cys Pro Arg Gly His Val Val Gly Leu Phe Arg Ala Ala Val Cys	
1175 1180 1185	
tct cgg ggc gtg gcc aaa tcc atc gat ttc atc ccc gtt gag aca ctc	3955
Ser Arg Gly Val Ala Lys Ser Ile Asp Phe Ile Pro Val Glu Thr Leu	
1190 1195 1200 1205	
gac gtt gtt aca agg tct ccc act ttc agt gac aac agc acg cca ccg	4003
Asp Val Val Thr Arg Ser Pro Thr Phe Ser Asp Asn Ser Thr Pro Pro	
1210 1215 1220	
gct gtg ccc cag acc tat cag gtc ggg tac ttg cat gct cca act ggc	4051
Ala Val Pro Gln Thr Tyr Gln Val Gly Tyr Leu His Ala Pro Thr Gly	
1225 1230 1235	
agt gga aag agc acc aag gtc cct gtc gcg tat gcc gcc cag ggg tac	4099
Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr Ala Ala Gln Gly Tyr	
1240 1245 1250	
aaa gta cta gtg ctt aac ccc tcg gta gct gcc acc ctg ggg ttt ggg	4147
Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly	
1255 1260 1265	
gcg tac cta tcc aag gca cat ggc atc aat ccc aac att agg act gga	4195
Ala Tyr Leu Ser Lys Ala His Gly Ile Asn Pro Asn Ile Arg Thr Gly	
1270 1275 1280 1285	
gtc agg acc gtg atg acc ggg gag gcc atc acg tac tcc aca tat ggc	4243
Val Arg Thr Val Met Thr Gly Glu Ala Ile Thr Tyr Ser Thr Tyr Gly	
1290 1295 1300	
aaa ttt ctc gcc gat ggg ggc tgc gct agc ggc gcc tat gac atc atc	4291
Lys Phe Leu Ala Asp Gly Gly Cys Ala Ser Gly Ala Tyr Asp Ile Ile	
1305 1310 1315	
ata tgc gat gaa tgc cac gct gtg gat gct acc tcc att ctc ggc atc	4339
Ile Cys Asp Glu Cys His Ala Val Asp Ala Thr Ser Ile Leu Gly Ile	
1320 1325 1330	
gga acg gtc ctt gat caa gca gag aca gcc ggg gtc aga cta act gtg	4387
Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Val Arg Leu Thr Val	
1335 1340 1345	
ctg gct acg gcc aca ccc ccc ggg tca gtg aca acc ccc cat ccc gat	4435
Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Thr Pro His Pro Asp	
1350 1355 1360 1365	

ata gaa gag gta ggc ctc ggg cgg gag ggt gag atc ccc ttc tat ggg Ile Glu Glu Val Gly Leu Gly Arg Glu Gly Glu Ile Pro Phe Tyr Gly 1370 1375 1380	4483
agg gcg att ccc cta tcc tgc atc aag gga ggg aga cac ctg att ttc Arg Ala Ile Pro Leu Ser Cys Ile Lys Gly Gly Arg His Leu Ile Phe 1385 1390 1395	4531
tgc cac tca aag aaa aag tgt gac gag ctc gcg gcg gcc ctt cgg ggc Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala Leu Arg Gly 1400 1405 1410	4579
atg ggc ttg aat gcc gtg gca tac tat aga ggg ttg gac gtc tcc ata Met Gly Leu Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Ile 1415 1420 1425	4627
ata cca gct cag gga gat gtg gtg gtc gtc gcc acc gac gcc ctc atg Ile Pro Ala Gln Gly Asp Val Val Val Val Ala Thr Asp Ala Leu Met 1430 1435 1440 1445	4675
acg ggg tac act gga gac ttt gac tcc gtg atc gac tgc aat gta gcg Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Val Ala 1450 1455 1460	4723
gtc acc caa gct gtc gac ttc agc ctg gac ccc acc ttc act ata acc Val Thr Gln Ala Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Thr 1465 1470 1475	4771
aca cag act gtc cca caa gac gct gtc tca cgc agt cag cgc cgc ggg Thr Gln Thr Val Pro Gln Asp Ala Val Ser Arg Ser Gln Arg Arg Gly 1480 1485 1490	4819
cgc aca ggt aga gga aga cag ggc act tat agg tat gtt tcc act ggt Arg Thr Gly Arg Gly Arg Gln Gly Thr Tyr Arg Tyr Val Ser Thr Gly 1495 1500 1505	4867
gaa cga gcc tca gga atg ttt gac agt gta gtg ctt tgt gag tgc tac Glu Arg Ala Ser Gly Met Phe Asp Ser Val Val Leu Cys Glu Cys Tyr 1510 1515 1520 1525	4915
gac gca ggg gct gcg tgg tac gat ctc aca cca gcg gag acc acc gtc Asp Ala Gly Ala Ala Trp Tyr Asp Leu Thr Pro Ala Glu Thr Thr Val 1530 1535 1540	4963
agg ctt aga gcg tat ttc aac acg ccc ggc cta ccc gtg tgt caa gac Arg Leu Arg Ala Tyr Phe Asn Thr Pro Gly Leu Pro Val Cys Gln Asp 1545 1550 1555	5011
cat ctt gaa ttt tgg gag gca gtt ttc acc ggc ctc aca cac ata gac His Leu Glu Phe Trp Glu Ala Val Phe Thr Gly Leu Thr His Ile Asp 1560 1565 1570	5059
gcc cac ttc ctc tcc caa aca aag caa gcg ggg gag aac ttc gcg tac Ala His Phe Leu Ser Gln Thr Lys Gln Ala Gly Glu Asn Phe Ala Tyr 1575 1580 1585	5107
cta gta gcc tac caa gct acg gtg tgc gcc aga gcc aag gcc cct ccc	5155

Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Lys	Ala	Pro	Pro		
1590					1595				1600					1605		
cgc	tcc	tgg	gac	gcc	atg	tgg	aag	tgc	ctg	gcc	cga	ctc	aag	cct	acg	5203
Pro	Ser	Trp	Asp	Ala	Met	Trp	Lys	Cys	Leu	Ala	Arg	Leu	Lys	Pro	Thr	
				1610					1615					1620		
ctt	gcg	ggc	ccc	aca	cct	ctc	ctg	tac	cgt	ttg	ggc	cct	att	acc	aat	5251
Leu	Ala	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Pro	Ile	Thr	Asn	
				1625					1630					1635		
gag	gtc	acc	ctc	aca	cac	cct	ggg	acg	aag	tac	atc	gcc	aca	tgc	atg	5299
Glu	Val	Thr	Leu	Thr	His	Pro	Gly	Thr	Lys	Tyr	Ile	Ala	Thr	Cys	Met	
				1640					1645					1650		
caa	gct	gac	ctt	gag	gtc	atg	acc	agc	acg	tgg	gtc	cta	gct	gga	gga	5347
Gln	Ala	Asp	Leu	Glu	Val	Met	Thr	Ser	Thr	Trp	Val	Leu	Ala	Gly	Gly	
						1660						1665				
gtc	ctg	gca	gcc	gtc	gcc	gca	tat	tgc	ctg	gcg	act	gga	tgc	gtt	tcc	5395
Val	Leu	Ala	Ala	Val	Ala	Ala	Tyr	Cys	Leu	Ala	Thr	Gly	Cys	Val	Ser	
1670					1675					1680					1685	
atc	atc	ggc	cgc	ttg	cac	gtc	aac	cag	cga	gtc	gtc	gtt	gcg	ccg	gat	5443
Ile	Ile	Gly	Arg	Leu	His	Val	Asn	Gln	Arg	Val	Val	Val	Ala	Pro	Asp	
				1690					1695					1700		
aag	gag	gtc	ctg	tat	gag	gct	ttt	gat	gag	atg	gag	gaa	tgc	gcc	tct	5491
Lys	Glu	Val	Leu	Tyr	Glu	Ala	Phe	Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	
				1705				1710						1715		
agg	gcg	gct	ctc	atc	gaa	gag	ggg	cag	cgg	ata	gcc	gag	atg	ttg	aag	5539
Arg	Ala	Ala	Leu	Ile	Glu	Glu	Gly	Gln	Arg	Ile	Ala	Glu	Met	Leu	Lys	
				1720				1725						1730		
tcc	aag	atc	caa	ggc	ttg	ctg	cag	cag	gcc	tct	aag	cag	gcc	cag	gac	5587
Ser	Lys	Ile	Gln	Gly	Leu	Leu	Gln	Gln	Ala	Ser	Lys	Gln	Ala	Gln	Asp	
				1735			1740				1745					
ata	caa	ccc	gct	atg	cag	gct	tca	tgg	ccc	aaa	gtg	gaa	caa	ttt	tgg	5635
Ile	Gln	Pro	Ala	Met	Gln	Ala	Ser	Trp	Pro	Lys	Val	Glu	Gln	Phe	Trp	
1750					1755					1760					1765	
gcc	aga	cac	atg	tgg	aac	ttc	att	agc	ggc	atc	caa	tac	ctc	gca	gga	5683
Ala	Arg	His	Met	Trp	Asn	Phe	Ile	Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	
				1770					1775					1780		
ttg	tca	aca	ctg	cca	ggg	aac	ccc	gcg	gtg	gct	tcc	atg	atg	gca	ttc	5731
Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	Ala	Val	Ala	Ser	Met	Met	Ala	Phe	
				1785				1790						1795		
agt	gcc	gcc	ctc	acc	agt	ccg	ttg	tcg	acc	agt	acc	acc	atc	ctt	ctc	5779
Ser	Ala															

1815	1820	1825	
gcc acc ggc ttt gtc gtc agt ggc ctg gtg ggg gct gcc gtg ggc agc Ala Thr Gly Phe Val Val Ser Gly Leu Val Gly Ala Ala Val Gly Ser 1830 1835 1840 1845			5875
ata ggc ctg ggt aag gtg ctg gtg gac atc ctg gca gga tat ggt gcg Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr Gly Ala 1850 1855 1860			5923
ggc att tcg ggg gcc ctc gtc gca ttc aag atc atg tct ggc gag aag Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Lys 1865 1870 1875			5971
ccc tct atg gaa gat gtc atc aat cta ctg cct ggg atc ctg tct ccg Pro Ser Met Glu Asp Val Ile Asn Leu Leu Pro Gly Ile Leu Ser Pro 1880 1885 1890			6019
gga gcc ctg gtg gtg ggg gtc atc tgc gcg gcc att ctg cgc cgc cac Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala Ile Leu Arg Arg His 1895 1900 1905			6067
gtg gga ccg ggg gag ggc gcg gtc caa tgg atg aac agg ctt att gcc Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala 1910 1915 1920 1925			6115
ttt gct tcc aga gga aac cac gtc gcc cct act cac tac gtg acg gag Phe Ala Ser Arg Gly Asn His Val Ala Pro Thr His Tyr Val Thr Glu 1930 1935 1940			6163
tcg gat gcg tcg cag cgt gtg acc caa cta ctt ggc tct ctt act ata Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu Gly Ser Leu Thr Ile 1945 1950 1955			6211
acc agc cta ctc aga aga ctc cac aat tgg ata act gag gac tgc ccc Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile Thr Glu Asp Cys Pro 1960 1965 1970			6259
atc cca tgc tcc gga tcc tgg ctc cgc gac gtg tgg gac tgg gtt tgc Ile Pro Cys Ser Gly Ser Trp Leu Arg Asp Val Trp Asp Trp Val Cys 1975 1980 1985			6307
acc atc ttg aca gac ttc aaa aat tgg ctg acc tct aaa ttg ttc ccc Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr Ser Lys Leu Phe Pro 1990 1995 2000 2005			6355
aag ctg ccc ggc ctc ccc ttc atc tct tgt caa aag ggg tac aag ggt Lys Leu Pro Gly Leu Pro Phe Ile Ser Cys Gln Lys Gly Tyr Lys Gly 2010 2015 2020			6403
gtg tgg gcc ggc act ggc atc atg acc acg cgc tgc cct tgc ggc gcc Val Trp Ala Gly Thr Gly Ile Met Thr Thr Arg Cys Pro Cys Gly Ala 2025 2030 2035			6451
aac atc tct ggc aat gtc cgc ctg ggc tct atg agg atc aca ggg cct Asn Ile Ser Gly Asn Val Arg Leu Gly Ser Met Arg Ile Thr Gly Pro 2040 2045 2050			6499

2040	2045	2050	
aaa acc tgc atg aac acc tgg cag ggg acc ttt cct atc aat tgc tac Lys Thr Cys Met Asn Thr Trp Gln Gly Thr Phe Pro Ile Asn Cys Tyr 2055	2060	2065	6547
acg gag ggc cag tgc gcg ccg aaa ccc ccc acg aac tac aag acc gcc Thr Glu Gly Gln Cys Ala Pro Lys Pro Pro Thr Asn Tyr Lys Thr Ala 2070	2075	2080	6595
atc tgg agg gtg gcg gcc tcg gag tac gcg gag gtg acg cag cat ggg Ile Trp Arg Val Ala Ala Ser Glu Tyr Ala Glu Val Thr Gln His Gly 2090	2095	2100	6643
tcg tac tcc tat gta aca gga ctg acc act gac aat ctg aaa att cct Ser Tyr Ser Tyr Val Thr Gly Leu Thr Thr Asp Asn Leu Lys Ile Pro 2105	2110	2115	6691
tgc caa cta cct tct cca gag ttt ttc tcc tgg gtg gac ggt gtg cag Cys Gln Leu Pro Ser Pro Glu Phe Phe Ser Trp Val Asp Gly Val Gln 2120	2125	2130	6739
atc cat agg ttt gca ccc aca cca aag ccg ttt ttc cgg gat gag gtc Ile His Arg Phe Ala Pro Thr Pro Lys Pro Phe Phe Arg Asp Glu Val 2135	2140	2145	6787
tcg ttc tgc gtt ggg ctt aat tcc tat gct gtc ggg tcc cag ctt ccc Ser Phe Cys Val Gly Leu Asn Ser Tyr Ala Val Gly Ser Gln Leu Pro 2150	2155	2160	6835
tgt gaa cct gag ccc gac gca gac gta ttg agg tcc atg cta aca gat Cys Glu Pro Glu Pro Asp Ala Asp Val Leu Arg Ser Met Leu Thr Asp 2170	2175	2180	6883
ccg ccc cac atc acg gcg gag act gcg gcg cgg cgc ttg gca cgg gga Pro Pro His Ile Thr Ala Glu Thr Ala Ala Arg Arg Leu Ala Arg Gly 2185	2190	2195	6931
tca cct cca tct gag gcg agc tcc tca gtg agc cag cta tca gca ccg Ser Pro Pro Ser Glu Ala Ser Ser Ser Val Ser Gln Leu Ser Ala Pro 2200	2205	2210	6979
tcg ctg cgg gcc acc tgc acc acc cac agc aac acc tat gac gtg gac Ser Leu Arg Ala Thr Cys Thr Thr His Ser Asn Thr Tyr Asp Val Asp 2215	2220	2225	7027
atg gtc gat gcc aac ctg ctc atg gag ggc ggt gtg gct cag aca gag Met Val Asp Ala Asn Leu Leu Met Glu Gly Gly Val Ala Gln Thr Glu 2230	2235	2240	7075
cct gag tcc agg gtg ccc gtt ctg gac ttt ctc gag cca atg gcc gag Pro Glu Ser Arg Val Pro Val Leu Asp Phe Leu Glu Pro Met Ala Glu 2250	2255	2260	7123
gaa gag agc gac ctt gag ccc tca ata cca tcg gag tgc atg ctc ccc Glu Glu Ser Asp Leu Glu Pro Ser Ile Pro Ser Glu Cys Met Leu Pro 2265	2270	2275	7171

agg agc ggg ttt cca cgg gcc tta ccg gct tgg gca cgg cct gac tac	7219
Arg Ser Gly Phe Pro Arg Ala Leu Pro Ala Trp Ala Arg Pro Asp Tyr	
2280 2285 2290	
aac ccg ccg ctc gtg gaa tcg tgg agg agg cca gat tac caa ccg ccc	7267
Asn Pro Pro Leu Val Glu Ser Trp Arg Arg Pro Asp Tyr Gln Pro Pro	
2295 2300 2305	
acc gtt gct ggt tgt gct ctc ccc ccc ccc aag aag gcc ccg acg cct	7315
Thr Val Ala Gly Cys Ala Leu Pro Pro Pro Lys Lys Ala Pro Thr Pro	
2310 2315 2320 2325	
ccc cca agg aga cgc cgg aca gtg ggt ctg agc gag agc acc ata tca	7363
Pro Pro Arg Arg Arg Arg Thr Val Gly Leu Ser Glu Ser Thr Ile Ser	
2330 2335 2340	
gaa gcc ctc cag caa ctg gcc atc aag acc ttt ggc cag ccc ccc tcg	7411
Glu Ala Leu Gln Gln Leu Ala Ile Lys Thr Phe Gly Gln Pro Pro Ser	
2345 2350 2355	
agc ggt gat gca ggc tcg tcc acg ggg gcg ggc gcc gcc gaa tcc ggc	7459
Ser Gly Asp Ala Gly Ser Ser Thr Gly Ala Gly Ala Ala Glu Ser Gly	
2360 2365 2370	
ggt ccg acg tcc cct ggt gag ccg gcc ccc tca gag aca ggt tcc gcc	7507
Gly Pro Thr Ser Pro Gly Glu Pro Ala Pro Ser Glu Thr Gly Ser Ala	
2375 2380 2385	
tcc tct atg ccc ccc ctc gag ggg gag cct gga gat ccg gac ctg gag	7555
Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Glu	
2390 2395 2400 2405	
tct gat cag gta gag ctt caa cct ccc ccc cag ggg ggg ggg gta gct	7603
Ser Asp Gln Val Glu Leu Gln Pro Pro Pro Gln Gly Gly Gly Val Ala	
2410 2415 2420	
ccc ggt tcg ggc tcg ggg tct tgg tct act tgc tcc gag gag gac gat	7651
Pro Gly Ser Gly Ser Gly Ser Trp Ser Thr Cys Ser Glu Glu Asp Asp	
2425 2430 2435	
acc acc gtg tgc tgc tcc atg tca tac tcc tgg acc ggg gct cta ata	7699
Thr Thr Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Ile	
2440 2445 2450	
act ccc tgt agc ccc gaa gag gaa aag ttg cca atc aac cct ttg agt	7747
Thr Pro Cys Ser Pro Glu Glu Glu Lys Leu Pro Ile Asn Pro Leu Ser	
2455 2460 2465	
aac tcg ctg ttg cga tac cat aac aag gtg tac tgt aca aca tca aag	7795
Asn Ser Leu Leu Arg Tyr His Asn Lys Val Tyr Cys Thr Thr Ser Lys	
2470 2475 2480 2485	
agc gcc tca cag agg gct aaa aag gta act ttt gac agg acg caa gtg	7843
Ser Ala Ser Gln Arg Ala Lys Lys Val Thr Phe Asp Arg Thr Gln Val	
2490 2495 2500	

ctc gac gcc cat tat gac tca gtc tta aag gac atc aag cta gcg gct Leu Asp Ala His Tyr Asp Ser Val Leu Lys Asp Ile Lys Leu Ala Ala 2505 2510 2515	7891
tcc aag gtc agc gca agg ctc ctc acc ttg gag gag gcg tgc cag ttg Ser Lys Val Ser Ala Arg Leu Leu Thr Leu Glu Glu Ala Cys Gln Leu 2520 2525 2530	7939
act cca ccc cat tct gca aga tcc aag tat gga ttc ggg gcc aag gag Thr Pro Pro His Ser Ala Arg Ser Lys Tyr Gly Phe Gly Ala Lys Glu 2535 2540 2545	7987
gtc cgc agc ttg tcc ggg agg gcc gtt aac cac atc aag tcc gtg tgg Val Arg Ser Leu Ser Gly Arg Ala Val Asn His Ile Lys Ser Val Trp 2550 2555 2560 2565	8035
aag gac ctc ctg gaa gac cca caa aca cca att ccc aca acc atc atg Lys Asp Leu Leu Glu Asp Pro Gln Thr Pro Ile Pro Thr Thr Ile Met 2570 2575 2580	8083
gcc aaa aat gag gtg ttc tgc gtg gac ccc gcc aag ggg ggt aag aaa Ala Lys Asn Glu Val Phe Cys Val Asp Pro Ala Lys Gly Gly Lys Lys 2585 2590 2595	8131
cca gct cgc ctc atc gtt tac cct gac ctc ggc gtc cgg gtc tgc gag Pro Ala Arg Leu Ile Val Tyr Pro Asp Leu Gly Val Arg Val Cys Glu 2600 2605 2610	8179
aaa atg gcc ctc tat gac att aca caa aag ctt cct cag gcg gta atg Lys Met Ala Leu Tyr Asp Ile Thr Gln Lys Leu Pro Gln Ala Val Met 2615 2620 2625	8227
gga gct tcc tat ggc ttc cag tac tcc cct gcc caa cgg gtg gag tat Gly Ala Ser Tyr Gly Phe Gln Tyr Ser Pro Ala Gln Arg Val Glu Tyr 2630 2635 2640 2645	8275
ctc ttg aaa gca tgg gcg gaa aag aag gac ccc atg ggt ttt tcg tat Leu Leu Lys Ala Trp Ala Glu Lys Lys Asp Pro Met Gly Phe Ser Tyr 2650 2655 2660	8323
gat acc cga tgc ttc gac tca acc gtc act gag aga gac atc agg acc Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Arg Asp Ile Arg Thr 2665 2670 2675	8371
gag gag tcc ata tac cag gcc tgc tcc ctg ccc gag gag gcc cgc act Glu Glu Ser Ile Tyr Gln Ala Cys Ser Leu Pro Glu Glu Ala Arg Thr 2680 2685 2690	8419
gcc ata cac tcg ctg act gag aga ctt tac gta gga ggg ccc atg ttc Ala Ile His Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Met Phe 2695 2700 2705	8467
aac agc aag ggt caa acc tgc ggt tac aga cgt tgc cgc gcc agc ggg Asn Ser Lys Gly Gln Thr Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly 2710 2715 2720 2725	8515
gtg cta acc act agc atg ggt aac acc atc aca tgc tat gtg aaa gcc	8563

Val Leu Thr Thr Ser Met Gly Asn Thr Ile Thr Cys Tyr Val Lys Ala	
2730 2735 2740	
cta gcg gcc tgc aag gct gcg ggg ata gtt gcg ccc aca atg ctg gta	8611
Leu Ala Ala Cys Lys Ala Ala Gly Ile Val Ala Pro Thr Met Leu Val	
2745 2750 2755	
tgc ggc gat gac cta gta gtc atc tca gaa agc cag ggg act gag gag	8659
Cys Gly Asp Asp Leu Val Val Ile Ser Glu Ser Gln Gly Thr Glu Glu	
2760 2765 2770	
gac gag cgg aac ctg aga gcc ttc acg gag gcc atg acc agg tac tct	8707
Asp Glu Arg Asn Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser	
2775 2780 2785	
gcc cct cct ggt gat ccc ccc aga ccg gaa tat gac ctg gag cta ata	8755
Ala Pro Pro Gly Asp Pro Pro Arg Pro Glu Tyr Asp Leu Glu Leu Ile	
2790 2795 2800 2805	
aca tcc tgt tcc tca aat gtg tct gtg gcg ttg ggc ccg cgg ggc cgc	8803
Thr Ser Cys Ser Ser Asn Val Ser Val Ala Leu Gly Pro Arg Gly Arg	
2810 2815 2820	
cgc aga tac tac ctg acc aga gac cca acc act cca ctc gcc cgg gct	8851
Arg Arg Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala	
2825 2830 2835	
gcc tgg gaa aca gtt aga cac tcc cct atc aat tca tgg ctg gga aac	8899
Ala Trp Glu Thr Val Arg His Ser Pro Ile Asn Ser Trp Leu Gly Asn	
2840 2845 2850	
atc atc cag tat gct cca acc ata tgg gtt cgc atg gtc cta atg aca	8947
Ile Ile Gln Tyr Ala Pro Thr Ile Trp Val Arg Met Val Leu Met Thr	
2855 2860 2865	
cac ttc ttc tcc att ctc atg gtc caa gac acc ctg gac cag aac ctc	8995
His Phe Phe Ser Ile Leu Met Val Gln Asp Thr Leu Asp Gln Asn Leu	
2870 2875 2880 2885	
aac ttt gag atg tat gga tca gta tac tcc gtg aat cct ttg gac ctt	9043
Asn Phe Glu Met Tyr Gly Ser Val Tyr Ser Val Asn Pro Leu Asp Leu	
2890 2895 2900	
cca gcc ata att gag agg tta cac ggg ctt gac gcc ttt tct atg cac	9091
Pro Ala Ile Ile Glu Arg Leu His Gly Leu Asp Ala Phe Ser Met His	
2905 2910 2915	
aca tac tct cac cac gaa ctg acg cgg gtg gct tca gcc ctc aga aaa	9139
Thr Tyr Ser His His Glu Leu Thr Arg Val Ala Ser Ala Leu Arg Lys	
2920 2925 2930	
ctt ggg gcg cca ccc ctc agg gtg tgg aag agt cgg gct cgc gca gtc	9187
Leu Gly Ala Pro Pro Leu Arg Val Trp Lys Ser Arg Ala Arg Ala Val	
2935 2940 2945	
agg gcg tcc ctc atc tcc cgt gga ggg aaa gcg gcc gtt tgc ggc cga	9235
Arg Ala Ser Leu Ile Ser Arg Gly Gly Lys Ala Ala Val Cys Gly Arg	

2950	2955	2960	2965	
tat ctc ttc aat tgg gcg gtg aag acc aag ctc aaa ctc act cca ttg				9283
Tyr Leu Phe Asn Trp Ala Val Lys Thr Lys Leu Lys Leu Thr Pro Leu	2970	2975	2980	
ccg gag gcg cgc cta ctg gac tta tcc agt tgg ttc acc gtc ggc gcc				9331
Pro Glu Ala Arg Leu Leu Asp Leu Ser Ser Trp Phe Thr Val Gly Ala	2985	2990	2995	
ggc ggg ggc gac att ttt cac agc gtg tcg cgc gcc cga ccc cgc tca				9379
Gly Gly Gly Asp Ile Phe His Ser Val Ser Arg Ala Arg Pro Arg Ser	3000	3005	3010	
tta ctc ttc ggc cta ctc cta ctt ttc gta ggg gta ggc ctc ttc cta				9427
Leu Leu Phe Gly Leu Leu Leu Leu Phe Val Gly Val Gly Leu Phe Leu	3015	3020	3025	
ctc ccc gct cgg tag agcggcacac actaggtaca ctccatagct aactgttcct				9482
Leu Pro Ala Arg				3030
tttttttttt tttttttttt tttttttttt tttttttttt ttcttttttt tttttttccc				9542
ttttttttcc cttctcatct tattctactt tctttcttgg tggctccatc ttagccctag				9602
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tctctgcaga tcatgt				9678

<210> 4
 <211> 3033
 <212> PRT
 <213> Hepatitis C virus

<400> 4

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			20					25					30		
Gly	Val	Tyr	Leu	Leu	Pro	Arg	Arg	Gly	Pro	Arg	Leu	Gly	Val	Arg	Thr
		35				40					45				
Thr	Arg	Lys	Thr	Ser	Glu	Arg	Ser	Gln	Pro	Arg	Gly	Arg	Arg	Gln	Pro
		50				55					60				
Ile	Pro	Lys	Asp	Arg	Arg	Ser	Thr	Gly	Lys	Ala	Trp	Gly	Lys	Pro	Gly
		65			70				75					80	
Arg	Pro	Trp	Pro	Leu	Tyr	Gly	Asn	Glu	Gly	Leu	Gly	Trp	Ala	Gly	Trp
			85					90						95	
Leu	Leu	Ser	Pro	Arg	Gly	Ser	Arg	Pro	Ser	Trp	Gly	Pro	Thr	Asp	Pro
			100					105					110		
Arg	His	Arg	Ser	Arg	Asn	Val	Gly	Lys	Val	Ile	Asp	Thr	Leu	Thr	Cys
		115					120					125			
Gly	Phe	Ala	Asp	Leu	Met	Gly	Tyr	Ile	Pro	Val	Val	Gly	Ala	Pro	Leu
		130				135					140				
Ser	Gly	Ala	Ala	Arg	Ala	Val	Ala	His	Gly	Val	Arg	Val	Leu	Glu	Asp

145					150					155				160
Gly	Val	Asn	Tyr	Ala	Thr	Gly	Asn	Leu	Pro	Gly	Phe	Pro	Phe	Ser Ile
				165					170					175
Phe	Leu	Leu	Ala	Leu	Leu	Ser	Cys	Ile	Thr	Val	Pro	Val	Ser	Ala Ala
			180					185					190	
Gln	Val	Lys	Asn	Thr	Ser	Ser	Ser	Tyr	Met	Val	Thr	Asn	Asp	Cys Ser
		195					200					205		
Asn	Asp	Ser	Ile	Thr	Trp	Gln	Leu	Glu	Ala	Ala	Val	Leu	His	Val Pro
	210					215					220			
Gly	Cys	Val	Pro	Cys	Glu	Arg	Val	Gly	Asn	Thr	Ser	Arg	Cys	Trp Val
225					230				235					240
Pro	Val	Ser	Pro	Asn	Met	Ala	Val	Arg	Gln	Pro	Gly	Ala	Leu	Thr Gln
				245					250					255
Gly	Leu	Arg	Thr	His	Ile	Asp	Met	Val	Val	Met	Ser	Ala	Thr	Phe Cys
			260					265					270	
Ser	Ala	Leu	Tyr	Val	Gly	Asp	Leu	Cys	Gly	Gly	Val	Met	Leu	Ala Ala
	275						280					285		
Gln	Val	Phe	Ile	Val	Ser	Pro	Gln	Tyr	His	Trp	Phe	Val	Gln	Glu Cys
	290					295					300			
Asn	Cys	Ser	Ile	Tyr	Pro	Gly	Thr	Ile	Thr	Gly	His	Arg	Met	Ala Trp
305					310					315				320
Asp	Met	Met	Met	Asn	Trp	Ser	Pro	Thr	Ala	Thr	Met	Ile	Leu	Ala Tyr
				325					330					335
Val	Met	Arg	Val	Pro	Glu	Val	Ile	Ile	Asp	Ile	Val	Ser	Gly	Ala His
			340					345					350	
Trp	Gly	Val	Met	Phe	Gly	Leu	Ala	Tyr	Phe	Ser	Met	Gln	Gly	Ala Trp
	355					360						365		
Ala	Lys	Val	Ile	Val	Ile	Leu	Leu	Leu	Ala	Ala	Gly	Val	Asp	Ala Gly
	370					375					380			
Thr	Thr	Thr	Val	Gly	Gly	Ala	Val	Ala	Arg	Ser	Thr	Asn	Val	Ile Ala
385					390					395				400
Gly	Val	Phe	Ser	His	Gly	Pro	Gln	Gln	Asn	Ile	Gln	Leu	Ile	Asn Thr
				405					410					415
Asn	Gly	Ser	Trp	His	Ile	Asn	Arg	Thr	Ala	Leu	Asn	Cys	Asn	Asp Ser
		420						425					430	
Leu	Asn	Thr	Gly	Phe	Leu	Ala	Ala	Leu	Phe	Tyr	Thr	Asn	Arg	Phe Asn
	435					440						445		
Ser	Ser	Gly	Cys	Pro	Gly	Arg	Leu	Ser	Ala	Cys	Arg	Asn	Ile	Glu Ala
	450					455					460			
Phe	Arg	Ile	Gly	Trp	Gly	Thr	Leu	Gln	Tyr	Glu	Asp	Asn	Val	Thr Asn
465					470					475				480
Pro	Glu	Asp	Met	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro	Lys	Pro Cys
				485					490					495
Gly	Val	Val	Pro	Ala	Arg	Ser	Val	Cys	Gly	Pro	Val	Tyr	Cys	Phe Thr
			500					505					510	
Pro	Ser	Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Arg	Gly	Val	Pro Thr
	515						520					525		
Tyr	Thr	Trp	Gly	Glu	Asn	Glu	Thr	Asp	Val	Phe	Leu	Leu	Asn	Ser Thr
	530					535					540			
Arg	Pro	Pro	Gln	Gly	Ser	Trp	Phe	Gly	Cys	Thr	Trp	Met	Asn	Ser Thr
545					550					555				560
Gly	Phe	Thr	Lys	Thr	Cys	Gly	Ala	Pro	Pro	Cys	Arg	Thr	Arg	Ala Asp
				565					570					575
Phe	Asn	Ala	Ser	Thr	Asp	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg Lys
			580					585					590	
His	Pro	Asp	Ala	Thr	Tyr	Ile	Lys	Cys	Gly	Ser	Gly	Pro	Trp	Leu Thr
		595					600						605	

Pro	Lys	Cys	Leu	Val	His	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys
	610					615					620				
Thr	Val	Asn	Phe	Thr	Ile	Phe	Lys	Ile	Arg	Met	Tyr	Val	Gly	Gly	Val
	625				630					635					640
Glu	His	Arg	Leu	Thr	Ala	Ala	Cys	Asn	Phe	Thr	Arg	Gly	Asp	Arg	Cys
				645					650					655	
Asp	Leu	Glu	Asp	Arg	Asp	Arg	Ser	Gln	Leu	Ser	Pro	Leu	Leu	His	Ser
			660					665					670		
Thr	Thr	Glu	Trp	Ala	Ile	Leu	Pro	Cys	Thr	Tyr	Ser	Asp	Leu	Pro	Ala
		675					680					685			
Leu	Ser	Thr	Gly	Leu	Leu	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	Gln
	690					695					700				
Tyr	Met	Tyr	Gly	Leu	Ser	Pro	Ala	Ile	Thr	Lys	Tyr	Val	Val	Arg	Trp
	705				710					715					720
Glu	Trp	Val	Val	Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	Arg	Val	Cys
				725					730					735	
Ala	Cys	Leu	Trp	Met	Leu	Ile	Leu	Leu	Gly	Gln	Ala	Glu	Ala	Ala	Leu
			740					745					750		
Glu	Lys	Leu	Val	Val	Leu	His	Ala	Ala	Ser	Ala	Ala	Asn	Cys	His	Gly
		755					760					765			
Leu	Leu	Tyr	Phe	Ala	Ile	Phe	Phe	Val	Ala	Ala	Trp	His	Ile	Arg	Gly
	770					775					780				
Arg	Val	Val	Pro	Leu	Thr	Thr	Tyr	Cys	Leu	Thr	Gly	Leu	Trp	Pro	Phe
	785				790					795					800
Cys	Leu	Leu	Leu	Met	Ala	Leu	Pro	Arg	Gln	Ala	Tyr	Ala	Tyr	Asp	Ala
				805					810					815	
Pro	Val	His	Gly	Gln	Ile	Gly	Val	Gly	Leu	Leu	Ile	Leu	Ile	Thr	Leu
			820					825					830		
Phe	Thr	Leu	Thr	Pro	Gly	Tyr	Lys	Thr	Leu	Leu	Gly	Gln	Cys	Leu	Trp
		835					840					845			
Trp	Leu	Cys	Tyr	Leu	Leu	Thr	Leu	Gly	Glu	Ala	Met	Ile	Gln	Glu	Trp
	850					855					860				
Val	Pro	Pro	Met	Gln	Val	Arg	Gly	Gly	Arg	Asp	Gly	Ile	Ala	Trp	Ala
	865				870					875					880
Val	Thr	Ile	Phe	Cys	Pro	Gly	Val	Val	Phe	Asp	Ile	Thr	Lys	Trp	Leu
				885					890					895	
Leu	Ala	Leu	Leu	Gly	Pro	Ala	Tyr	Leu	Leu	Arg	Ala	Ala	Leu	Thr	His
			900					905					910		
Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Ala	Leu	Ile	Arg	Val	Cys	Ala	Leu
		915					920					925			
Val	Lys	Gln	Leu	Ala	Gly	Gly	Arg	Tyr	Val	Gln	Val	Ala	Leu	Leu	Ala
	930					935					940				
Leu	Gly	Arg	Trp	Thr	Gly	Thr	Tyr	Ile	Tyr	Asp	His	Leu	Thr	Pro	Met
	945				950					955					960
Ser	Asp	Trp	Ala	Ala	Ser	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu
			965						970					975	
Pro	Ile	Ile	Phe	Ser	Pro	Met	Glu	Lys	Lys	Val	Ile	Val	Trp	Gly	Ala
			980					985					990		
Glu	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Leu	His	Gly	Leu	Pro	Val	Ser	Ala
		995				1000					1005				
Arg	Leu	Gly	Gln	Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Tyr	Thr	Ser
	1010					1015					1020				
Lys	Gly	Trp	Lys	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr
	1025				1030					1035					1040
Arg	Gly	Leu	Leu	Gly	Ala	Ile	Val	Val	Ser	Met	Thr	Gly	Arg	Asp	Arg
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Thr	Glu	Gln	Ala	Gly	Glu	Val	Gln	Ile	Leu	Ser	Thr	Val	Ser	Gln	Ser

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Phe	Leu Gly Thr Thr Ile Ser Gly Val Leu Trp Thr Val Tyr His Gly				
	1075		1080		1085
Ala	Gly Asn Lys Thr Leu Ala Gly Leu Arg Gly Pro Val Thr Gln Met				
	1090		1095		1100
Tyr	Ser Ser Ala Glu Gly Asp Leu Val Gly Trp Pro Ser Pro Pro Gly				
1105		1110		1115	1120
Thr	Lys Ser Leu Glu Pro Cys Lys Cys Gly Ala Val Asp Leu Tyr Leu				
	1125		1130		1135
Val	Thr Arg Asn Ala Asp Val Ile Pro Ala Arg Arg Arg Gly Asp Lys				
	1140		1145		1150
Arg	Gly Ala Leu Leu Ser Pro Arg Pro Ile Ser Thr Leu Lys Gly Ser				
	1155		1160		1165
Ser	Gly Gly Pro Val Leu Cys Pro Arg Gly His Val Val Gly Leu Phe				
	1170		1175		1180
Arg	Ala Ala Val Cys Ser Arg Gly Val Ala Lys Ser Ile Asp Phe Ile				
1185		1190		1195	1200
Pro	Val Glu Thr Leu Asp Val Val Thr Arg Ser Pro Thr Phe Ser Asp				
	1205		1210		1215
Asn	Ser Thr Pro Pro Ala Val Pro Gln Thr Tyr Gln Val Gly Tyr Leu				
	1220		1225		1230
His	Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr				
	1235		1240		1245
Ala	Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala				
	1250		1255		1260
Thr	Leu Gly Phe Gly Ala Tyr Leu Ser Lys Ala His Gly Ile Asn Pro				
1265		1270		1275	1280
Asn	Ile Arg Thr Gly Val Arg Thr Val Met Thr Gly Glu Ala Ile Thr				
	1285		1290		1295
Tyr	Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ala Ser Gly				
	1300		1305		1310
Ala	Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ala Val Asp Ala Thr				
	1315		1320		1325
Ser	Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly				
	1330		1335		1340
Val	Arg Leu Thr Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr				
1345		1350		1355	1360
Thr	Pro His Pro Asp Ile Glu Glu Val Gly Leu Gly Arg Glu Gly Glu				
	1365		1370		1375
Ile	Pro Phe Tyr Gly Arg Ala Ile Pro Leu Ser Cys Ile Lys Gly Gly				
	1380		1385		1390
Arg	His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala				
	1395		1400		1405
Ala	Ala Leu Arg Gly Met Gly Leu Asn Ala Val Ala Tyr Tyr Arg Gly				
	1410		1415		1420
Leu	Asp Val Ser Ile Ile Pro Ala Gln Gly Asp Val Val Val Val Ala				
1425		1430		1435	1440
Thr	Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile				
	1445		1450		1455
Asp	Cys Asn Val Ala Val Thr Gln Ala Val Asp Phe Ser Leu Asp Pro				
	1460		1465		1470
Thr	Phe Thr Ile Thr Thr Gln Thr Val Pro Gln Asp Ala Val Ser Arg				
	1475		1480		1485
Ser	Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Gln Gly Thr Tyr Arg				
	1490		1495		1500
Tyr	Val Ser Thr Gly Glu Arg Ala Ser Gly Met Phe Asp Ser Val Val				
1505		1510		1515	1520

Leu Cys Glu Cys Tyr Asp Ala Gly Ala Ala Trp Tyr Asp Leu Thr Pro
 1525 1530 1535
 Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Phe Asn Thr Pro Gly Leu
 1540 1545 1550
 Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ala Val Phe Thr Gly
 1555 1560 1565
 Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ala Gly
 1570 1575 1580
 Glu Asn Phe Ala Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg
 1585 1590 1595 1600
 Ala Lys Ala Pro Pro Pro Ser Trp Asp Ala Met Trp Lys Cys Leu Ala
 1605 1610 1615
 Arg Leu Lys Pro Thr Leu Ala Gly Pro Thr Pro Leu Leu Tyr Arg Leu
 1620 1625 1630
 Gly Pro Ile Thr Asn Glu Val Thr Leu Thr His Pro Gly Thr Lys Tyr
 1635 1640 1645
 Ile Ala Thr Cys Met Gln Ala Asp Leu Glu Val Met Thr Ser Thr Trp
 1650 1655 1660
 Val Leu Ala Gly Gly Val Leu Ala Ala Val Ala Ala Tyr Cys Leu Ala
 1665 1670 1675 1680
 Thr Gly Cys Val Ser Ile Ile Gly Arg Leu His Val Asn Gln Arg Val
 1685 1690 1695
 Val Val Ala Pro Asp Lys Glu Val Leu Tyr Glu Ala Phe Asp Glu Met
 1700 1705 1710
 Glu Glu Cys Ala Ser Arg Ala Ala Leu Ile Glu Glu Gly Gln Arg Ile
 1715 1720 1725
 Ala Glu Met Leu Lys Ser Lys Ile Gln Gly Leu Leu Gln Gln Ala Ser
 1730 1735 1740
 Lys Gln Ala Gln Asp Ile Gln Pro Ala Met Gln Ala Ser Trp Pro Lys
 1745 1750 1755 1760
 Val Glu Gln Phe Trp Ala Arg His Met Trp Asn Phe Ile Ser Gly Ile
 1765 1770 1775
 Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Val Ala
 1780 1785 1790
 Ser Met Met Ala Phe Ser Ala Ala Leu Thr Ser Pro Leu Ser Thr Ser
 1795 1800 1805
 Thr Thr Ile Leu Leu Asn Ile Met Gly Gly Trp Leu Ala Ser Gln Ile
 1810 1815 1820
 Ala Pro Pro Ala Gly Ala Thr Gly Phe Val Val Ser Gly Leu Val Gly
 1825 1830 1835 1840
 Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu
 1845 1850 1855
 Ala Gly Tyr Gly Ala Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile
 1860 1865 1870
 Met Ser Gly Glu Lys Pro Ser Met Glu Asp Val Ile Asn Leu Leu Pro
 1875 1880 1885
 Gly Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala
 1890 1895 1900
 Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met
 1905 1910 1915 1920
 Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ala Pro Thr
 1925 1930 1935
 His Tyr Val Thr Glu Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu
 1940 1945 1950
 Gly Ser Leu Thr Ile Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile
 1955 1960 1965
 Thr Glu Asp Cys Pro Ile Pro Cys Ser Gly Ser Trp Leu Arg Asp Val

1970	1975	1980
Trp Asp Trp Val Cys Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr		
1985	1990	1995
Ser Lys Leu Phe Pro Lys Leu Pro Gly Leu Pro Phe Ile Ser Cys Gln		2000
	2005	2010
Lys Gly Tyr Lys Gly Val Trp Ala Gly Thr Gly Ile Met Thr Thr Arg		2015
	2020	2025
Cys Pro Cys Gly Ala Asn Ile Ser Gly Asn Val Arg Leu Gly Ser Met		2030
	2035	2040
Arg Ile Thr Gly Pro Lys Thr Cys Met Asn Thr Trp Gln Gly Thr Phe		2045
	2050	2055
Pro Ile Asn Cys Tyr Thr Glu Gly Gln Cys Ala Pro Lys Pro Pro Thr		2060
2065	2070	2075
Asn Tyr Lys Thr Ala Ile Trp Arg Val Ala Ala Ser Glu Tyr Ala Glu		2080
	2085	2090
Val Thr Gln His Gly Ser Tyr Ser Tyr Val Thr Gly Leu Thr Thr Asp		2095
	2100	2105
Asn Leu Lys Ile Pro Cys Gln Leu Pro Ser Pro Glu Phe Phe Ser Trp		2110
	2115	2120
Val Asp Gly Val Gln Ile His Arg Phe Ala Pro Thr Pro Lys Pro Phe		2125
2130	2135	2140
Phe Arg Asp Glu Val Ser Phe Cys Val Gly Leu Asn Ser Tyr Ala Val		
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Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Ala Asp Val Leu Arg		2160
	2165	2170
Ser Met Leu Thr Asp Pro Pro His Ile Thr Ala Glu Thr Ala Ala Arg		2175
	2180	2185
Arg Leu Ala Arg Gly Ser Pro Pro Ser Glu Ala Ser Ser Ser Val Ser		2190
	2195	2200
Gln Leu Ser Ala Pro Ser Leu Arg Ala Thr Cys Thr Thr His Ser Asn		2205
	2210	2215
Thr Tyr Asp Val Asp Met Val Asp Ala Asn Leu Leu Met Glu Gly Gly		2220
2225	2230	2235
Val Ala Gln Thr Glu Pro Glu Ser Arg Val Pro Val Leu Asp Phe Leu		2240
	2245	2250
Glu Pro Met Ala Glu Glu Glu Ser Asp Leu Glu Pro Ser Ile Pro Ser		2255
	2260	2265
Glu Cys Met Leu Pro Arg Ser Gly Phe Pro Arg Ala Leu Pro Ala Trp		2270
	2275	2280
Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Ser Trp Arg Arg Pro		2285
	2290	2295
Asp Tyr Gln Pro Pro Thr Val Ala Gly Cys Ala Leu Pro Pro Pro Lys		2300
2305	2310	2315
Lys Ala Pro Thr Pro Pro Pro Arg Arg Arg Arg Thr Val Gly Leu Ser		2320
	2325	2330
Glu Ser Thr Ile Ser Glu Ala Leu Gln Gln Leu Ala Ile Lys Thr Phe		2335
	2340	2345
Gly Gln Pro Pro Ser Ser Gly Asp Ala Gly Ser Ser Thr Gly Ala Gly		2350
	2355	2360
Ala Ala Glu Ser Gly Gly Pro Thr Ser Pro Gly Glu Pro Ala Pro Ser		2365
	2370	2375
Glu Thr Gly Ser Ala Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly		2380
2385	2390	2395
Asp Pro Asp Leu Glu Ser Asp Gln Val Glu Leu Gln Pro Pro Pro Gln		2400
	2405	2410
Gly Gly Gly Val Ala Pro Gly Ser Gly Ser Gly Ser Trp Ser Thr Cys		2415

	2420		2425		2430										
Ser	Glu	Glu	Asp	Asp	Thr	Thr	Val	Cys	Cys	Ser	Met	Ser	Tyr	Ser	Trp
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Thr	Gly	Ala	Leu	Ile	Thr	Pro	Cys	Ser	Pro	Glu	Glu	Glu	Lys	Leu	Pro
	2450						2455					2460			
Ile	Asn	Pro	Leu	Ser	Asn	Ser	Leu	Leu	Arg	Tyr	His	Asn	Lys	Val	Tyr
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Cys	Thr	Thr	Ser	Lys	Ser	Ala	Ser	Gln	Arg	Ala	Lys	Lys	Val	Thr	Phe
			2485						2490				2495		
Asp	Arg	Thr	Gln	Val	Leu	Asp	Ala	His	Tyr	Asp	Ser	Val	Leu	Lys	Asp
		2500					2505					2510			
Ile	Lys	Leu	Ala	Ala	Ser	Lys	Val	Ser	Ala	Arg	Leu	Leu	Thr	Leu	Glu
	2515						2520					2525			
Glu	Ala	Cys	Gln	Leu	Thr	Pro	Pro	His	Ser	Ala	Arg	Ser	Lys	Tyr	Gly
	2530					2535					2540				
Phe	Gly	Ala	Lys	Glu	Val	Arg	Ser	Leu	Ser	Gly	Arg	Ala	Val	Asn	His
	2545				2550					2555				2560	
Ile	Lys	Ser	Val	Trp	Lys	Asp	Leu	Leu	Glu	Asp	Pro	Gln	Thr	Pro	Ile
		2565							2570				2575		
Pro	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu	Val	Phe	Cys	Val	Asp	Pro	Ala
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Lys	Gly	Gly	Lys	Lys	Pro	Ala	Arg	Leu	Ile	Val	Tyr	Pro	Asp	Leu	Gly
	2595					2600					2605				
Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Ile	Thr	Gln	Lys	Leu
	2610					2615				2620					
Pro	Gln	Ala	Val	Met	Gly	Ala	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	Pro	Ala
	2625			2630					2635					2640	
Gln	Arg	Val	Glu	Tyr	Leu	Leu	Lys	Ala	Trp	Ala	Glu	Lys	Lys	Asp	Pro
		2645					2650					2655			
Met	Gly	Phe	Ser	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	Thr	Glu
	2660						2665					2670			
Arg	Asp	Ile	Arg	Thr	Glu	Glu	Ser	Ile	Tyr	Gln	Ala	Cys	Ser	Leu	Pro
	2675					2680				2685					
Glu	Glu	Ala	Arg	Thr	Ala	Ile	His	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Val
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Gly	Gly	Pro	Met	Phe	Asn	Ser	Lys	Gly	Gln	Thr	Cys	Gly	Tyr	Arg	Arg
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Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Met	Gly	Asn	Thr	Ile	Thr
		2725						2730				2735			
Cys	Tyr	Val	Lys	Ala	Leu	Ala	Ala	Cys	Lys	Ala	Ala	Gly	Ile	Val	Ala
		2740					2745					2750			
Pro	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Ser	Glu	Ser
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Gln	Gly	Thr	Glu	Glu	Asp	Glu	Arg	Asn	Leu	Arg	Ala	Phe	Thr	Glu	Ala
	2770				2775				2780						
Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Arg	Pro	Glu	Tyr
	2785				2790				2795					2800	
Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	Ala	Leu
		2805						2810					2815		
Gly	Pro	Arg	Gly	Arg	Arg	Arg	Tyr	Tyr	Leu	Thr	Arg	Asp	Pro	Thr	Thr
		2820					2825					2830			
Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr	Val	Arg	His	Ser	Pro	Ile	Asn
	2835					2840					2845				
Ser	Trp	Leu	Gly	Asn	Ile	Ile	Gln	Tyr	Ala	Pro	Thr	Ile	Trp	Val	Arg
	2850				2855				2860						
Met	Val	Leu	Met	Thr	His	Phe	Phe	Ser	Ile	Leu	Met	Val	Gln	Asp	Thr
	2865				2870				2875					2880	

gag cgg tcc cag cca cgt ggg agg cgc cag ccc atc ccc aaa cat cgg	547
Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys His Arg	
55 60 65	
cgc tcc act ggc aag tcc tgg ggg aag cca gga tac ccc tgg ccc ctg	595
Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly Tyr Pro Trp Pro Leu	
70 75 80 85	
tat ggg aat gag ggg ctc ggt tgg gca gga tgg ctc ctg tcc cct cga	643
Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp Leu Leu Ser Pro Arg	
90 95 100	
ggt tcc cgt ccc tca tgg ggc ccc aat gac ccc cgg cat agg tcg cgc	691
Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro Arg His Arg Ser Arg	
105 110 115	
aat gtg ggt aag gtc atc gat acc cta acg tgc ggc ttt gcc gac ctc	739
Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys Gly Phe Ala Asp Leu	
120 125 130	
ttg ggg tac gtc ccc gtc gta ggc gcc ccg ctt agt ggc gtt gcc agt	787
Leu Gly Tyr Val Pro Val Val Gly Ala Pro Leu Ser Gly Val Ala Ser	
135 140 145	
gct ctc gcg cac ggc gtg aga gtc ctg gag gac ggg gtt aat ttt gca	835
Ala Leu Ala His Gly Val Arg Val Leu Glu Asp Gly Val Asn Phe Ala	
150 155 160 165	
aca ggg aac tta cct ggt tgc tcc ttt tct atc ttc ttg ctg gcc cta	883
Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile Phe Leu Leu Ala Leu	
170 175 180	
ctg tcc tgc atc act act ccg gtc tct gct gtc caa gtg aag aac acc	931
Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Val Gln Val Lys Asn Thr	
185 190 195	
agc aac gcc tat atg gcg act aac gac tgt tcc aat gac agc atc act	979
Ser Asn Ala Tyr Met Ala Thr Asn Asp Cys Ser Asn Asp Ser Ile Thr	
200 205 210	
tgg cag ctt gag gcc gca gtc ctc cat gtc ccc ggg tgc gtc ccg tgc	1027
Trp Gln Leu Glu Ala Ala Val Leu His Val Pro Gly Cys Val Pro Cys	
215 220 225	
gag aaa atg ggg aac aca tca cgg tgc tgg ata cca gtc tca cca aac	1075
Glu Lys Met Gly Asn Thr Ser Arg Cys Trp Ile Pro Val Ser Pro Asn	
230 235 240 245	
gtg gct gtg cgg cag cct ggc gcc ctc acg cgg ggc ttg cgg acg cac	1123
Val Ala Val Arg Gln Pro Gly Ala Leu Thr Arg Gly Leu Arg Thr His	
250 255 260	
atc gac atg gtc gtg ttg tcc gcc acg ctc tgc tcc gct ctc tac gtg	1171
Ile Asp Met Val Val Leu Ser Ala Thr Leu Cys Ser Ala Leu Tyr Val	
265 270 275	

ggg gac ctc tgt ggc ggg gtg atg ctc gcg tcc cag atg ttc att gtc	1219
Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ser Gln Met Phe Ile Val	
280 285 290	
tcg ccg cag cac cac tgg ttc gtg cag gaa tgc aat tgc tcc atc tac	1267
Ser Pro Gln His His Trp Phe Val Gln Glu Cys Asn Cys Ser Ile Tyr	
295 300 305	
cct ggc gcc atc act ggg cac cgt atg gca tgg gac atg atg atg aac	1315
Pro Gly Ala Ile Thr Gly His Arg Met Ala Trp Asp Met Met Met Asn	
310 315 320 325	
tgg tcg ccc acg acc acc atg atc ctg gcg tac gtg atg cgc gtt ccc	1363
Trp Ser Pro Thr Thr Thr Met Ile Leu Ala Tyr Val Met Arg Val Pro	
330 335 340	
gag gtc atc ata gac atc att agc gga gct cac tgg ggc gtc atg ttt	1411
Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His Trp Gly Val Met Phe	
345 350 355	
ggc ctg gcc tac ttc tct atg cag gga gcg tgg gcg aag gtc gtt gtc	1459
Gly Leu Ala Tyr Phe Ser Met Gln Gly Ala Trp Ala Lys Val Val Val	
360 365 370	
atc ctc ctg ctg gcc tct ggg gtg gac gcg tac acc acc acg act ggg	1507
Ile Leu Leu Leu Ala Ser Gly Val Asp Ala Tyr Thr Thr Thr Thr Gly	
375 380 385	
agc gct gct ggg cgc act acc agt agc ctg gcc agc gcc ttc tcc cct	1555
Ser Ala Ala Gly Arg Thr Thr Ser Ser Leu Ala Ser Ala Phe Ser Pro	
390 395 400 405	
ggc gct cgg cag aac att cag ctc att aat acc aat ggt agc tgg cac	1603
Gly Ala Arg Gln Asn Ile Gln Leu Ile Asn Thr Asn Gly Ser Trp His	
410 415 420	
atc aac cgc acc gcc ctg aat tgc aac gat tcc ttg cac acc ggc ttc	1651
Ile Asn Arg Thr Ala Leu Asn Cys Asn Asp Ser Leu His Thr Gly Phe	
425 430 435	
ttc acg gcc ctg ttc tac atc cat aag ttc aac tcg tcg gga tgt ccc	1699
Phe Thr Ala Leu Phe Tyr Ile His Lys Phe Asn Ser Ser Gly Cys Pro	
440 445 450	
gag cgc ctg tcc gcc tgt cgc aac atc gag gac ttc cgg ata gga tgg	1747
Glu Arg Leu Ser Ala Cys Arg Asn Ile Glu Asp Phe Arg Ile Gly Trp	
455 460 465	
ggc gcc ctg caa tac gac gac aat gtc acc aat cca gaa gat atg agg	1795
Gly Ala Leu Gln Tyr Asp Asp Asn Val Thr Asn Pro Glu Asp Met Arg	
470 475 480 485	
cca tat tgc tgg cac tac cca cca aaa cag tgt ggc gta gtc ccc gca	1843
Pro Tyr Cys Trp His Tyr Pro Pro Lys Gln Cys Gly Val Val Pro Ala	
490 495 500	
ggg acc gtg tgc ggc cca gtg tac tgt ttc acc cct agc ccg gtg gta	1891

Gly	Thr	Val	Cys	Gly	Pro	Val	Tyr	Cys	Phe	Thr	Pro	Ser	Pro	Val	Val		
			505					510					515				
gtg	ggc	acg	acc	gat	aga	ctt	gga	gtg	cct	act	tac	acg	tgg	gga	gag	1939	
Val	Gly	Thr	Thr	Asp	Arg	Leu	Gly	Val	Pro	Thr	Tyr	Thr	Trp	Gly	Glu		
			520				525					530					
aat	gag	aca	gat	gtc	ttc	cta	ttg	aac	agc	acc	cga	cca	ccg	tcg	ggg	1987	
Asn	Glu	Thr	Asp	Val	Phe	Leu	Leu	Asn	Ser	Thr	Arg	Pro	Pro	Ser	Gly		
			535				540				545						
tca	tgg	ttt	ggc	tgc	acg	tgg	atg	aac	tcc	act	ggc	ttc	acc	aag	acc	2035	
Ser	Trp	Phe	Gly	Cys		Trp	Met	Asn	Ser	Thr	Gly	Phe	Thr	Lys	Thr		
550					555					560					565		
tgc	ggc	gca	cca	ccc	tgc	cgc	act	aga	gct	gac	ttc	aat	acc	agc	aca	2083	
Cys	Gly	Ala	Pro	Pro	Cys	Arg	Thr	Arg	Ala	Asp	Phe	Asn	Thr	Ser	Thr		
				570					575					580			
gat	ctg	ttg	tgc	ccc	acg	gac	tgt	ttt	aga	aaa	cat	cct	gaa	gcc	act	2131	
Asp	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg	Lys	His	Pro	Glu	Ala	Thr		
			585					590					595				
tac	atc	aaa	tgt	ggc	tcc	ggg	cct	tgg	ctc	acg	cca	aag	tgt	ctg	gtt	2179	
Tyr	Ile	Lys	Cys	Gly	Ser	Gly	Pro	Trp	Leu	Thr	Pro	Lys	Cys	Leu	Val		
		600					605					610					
gac	tac	ccc	tac	agg	ctc	tgg	cat	tac	cct	tgc	aca	gtc	aat	tac	tcc	2227	
Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys	Thr	Val	Asn	Tyr	Ser		
		615				620					625						
acc	ttc	aag	atc	agg	atg	tat	gtg	ggg	gga	gtt	gag	cac	agg	ctc	atg	2275	
Thr	Phe	Lys	Ile	Arg	Met	Tyr	Val	Gly	Gly	Val	Glu	His	Arg	Leu	Met		
630					635					640					645		
gcc	gcg	tgc	aat	ttc	act	cgt	ggg	gat	cgc	tgc	aac	ttg	gag	gat	agg	2323	
Ala	Ala	Cys	Asn	Phe	Thr	Arg	Gly	Asp	Arg	Cys	Asn	Leu	Glu	Asp	Arg		
				650					655					660			
gac	aga	agt	caa	cag	act	cct	ctg	ttg	cac	tcc	acc	acg	gaa	tgg	gcc	2371	
Asp	Arg	Ser	Gln	Gln	Thr	Pro	Leu	Leu	His	Ser	Thr	Thr	Glu	Trp	Ala		
			665					670					675				
att	ttg	ccc	tgc	tct	ttc	tca	gac	ttg	ccc	gct	ttg	tcg	act	ggc	ctt	2419	
Ile	Leu	Pro	Cys	Ser	Phe	Ser	Asp	Leu	Pro	Ala	Leu	Ser	Thr	Gly	Leu		
		680					685					690					
ctc	cac	ctc	cac	caa	aat	atc	gtg	gac	gta	caa	tat	atg	tat	ggc	ctg	2467	
Leu	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	Gln	Tyr	Met	Tyr	Gly	Leu		
				695			700				705						
tca	cct	gcc	ctc	aca	caa	tat	atc	gtt	cga	tgg	gag	tgg	gta	gta	ctc	2515	
Ser	Pro	Ala	Leu	Thr		Tyr	Ile	Val	Arg	Trp	Glu	Trp	Val	Val	Leu		
710					715					720					725		
tta	ttc	ctg	ctc	cta	gcg	gac	gcc	agg	gtc	tgc	gcc	tgc	ttg	tgg	atg	2563	
Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	Arg	Val	Cys	Ala	Cys	Leu	Trp	Met		

730										735					740					
ctc	atc	ttg	ctg	ggc	caa	gcc	gaa	gca	gca	ctg	gag	aag	ctg	gtc	gtc	2611				
Leu	Ile	Leu	Leu	Gly	Gln	Ala	Glu	Ala	Ala	Leu	Glu	Lys	Leu	Val	Val					
745				750				755												
ttg	cac	gct	gcg	agc	gca	gct	agc	tgc	aat	ggc	ttc	ctg	tat	ttt	gtc	2659				
Leu	His	Ala	Ala	Ser	Ala	Ala	Ser	Cys	Asn	Gly	Phe	Leu	Tyr	Phe	Val					
760				765				770												
atc	ttt	ctc	gtg	gct	gct	tgg	cac	atc	aag	ggg	agg	gtg	gtc	ccc	ttg	2707				
Ile	Phe	Leu	Val	Ala	Ala	Trp	His	Ile	Lys	Gly	Arg	Val	Val	Pro	Leu					
775				780				785												
gct	gct	tat	tcc	ctt	act	ggc	ctg	tgg	ccg	ttc	tgc	cta	ctg	ctc	cta	2755				
Ala	Ala	Tyr	Ser	Leu	Thr	Gly	Leu	Trp	Pro	Phe	Cys	Leu	Leu	Leu	Leu					
790				795				800				805								
gca	ctg	ccc	cag	cag	gct	tac	gcc	tat	gat	gca	tct	gtg	cac	gga	cag	2803				
Ala	Leu	Pro	Gln	Gln	Ala	Tyr	Ala	Tyr	Asp	Ala	Ser	Val	His	Gly	Gln					
810				815				820												
gtg	ggc	gcg	gct	ttg	cta	gta	ctg	att	acc	ctc	ttt	aca	ctc	acc	ccg	2851				
Val	Gly	Ala	Ala	Leu	Leu	Val	Leu	Ile	Thr	Leu	Phe	Thr	Leu	Thr	Pro					
825				830				835												
ggg	tat	aag	acc	ctt	ctc	agc	cag	tcc	ctg	tgg	tgg	ttg	tgc	tat	ctc	2899				
Gly	Tyr	Lys	Thr	Leu	Leu	Ser	Gln	Ser	Leu	Trp	Trp	Leu	Cys	Tyr	Leu					
840				845				850												
ctg	acc	ctg	gcg	gaa	acc	atg	gtc	cag	gag	tgg	gca	cca	tcc	atg	cag	2947				
Leu	Thr	Leu	Ala	Glu	Thr	Met	Val	Gln	Glu	Trp	Ala	Pro	Ser	Met	Gln					
855				860				865												
gcg	cgc	ggc	ggc	cgt	gat	ggc	atc	ata	tgg	gcc	gcc	acc	ata	ttt	tgc	2995				
Ala	Arg	Gly	Gly	Arg	Asp	Gly	Ile	Ile	Trp	Ala	Ala	Thr	Ile	Phe	Cys					
870				875				880				885								
ccg	ggc	gta	gtg	ttt	gac	ata	acc	aag	tgg	ctc	tta	gcg	gtg	ctt	ggg	3043				
Pro	Gly	Val	Val	Phe	Asp	Ile	Thr	Lys	Trp	Leu	Leu	Ala	Val	Leu	Gly					
890				895				900												
cct	ggg	tac	ctc	cta	aga	ggg	gct	ttg	acg	cgc	gtg	cca	tat	ttc	gtc	3091				
Pro	Gly	Tyr	Leu	Leu	Arg	Gly	Ala	Leu	Thr	Arg	Val	Pro	Tyr	Phe	Val					
905				910				915												
aga	gcc	cac	gct	ctg	ctg	aga	atg	tgc	act	atg	gtg	agg	cac	ctc	gcg	3139				
Arg	Ala	His	Ala	Leu	Leu	Arg	Met	Cys	Thr	Met	Val	Arg	His	Leu	Ala					
920				925				930												
ggg	ggg	agg	tac	gtc	cag	atg	gcg	cta	tta	gcc	ctt	ggc	agg	tgg	act	3187				
Gly	Gly	Arg	Tyr	Val	Gln	Met	Ala	Leu	Leu	Ala	Leu	Gly	Arg	Trp	Thr					
935				940				945												
ggc	act	tac	atc	tat	gac	cac	ctc	acc	cct	atg	tcg	gat	tgg	gct	gct	3235				
Gly	Thr	Tyr	Ile	Tyr	Asp	His	Leu	Thr	Pro	Met	Ser	Asp	Trp	Ala	Ala					
950				955				960				965								

agc ggc ctg cgg gac ttg gcg gtc gct gtg gag cct atc atc ttc agt	3283
Ser Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Ile Ile Phe Ser	
970 975 980	
ccg atg gag aag aaa gtc atc gtt tgg gga gcg gag acg gct gcg tgc	3331
Pro Met Glu Lys Lys Val Ile Val Trp Gly Ala Glu Thr Ala Ala Cys	
985 990 995	
ggg gac atc ttg cac gga ctt ccc gtg tcc gcc cga ctc ggt cgg gag	3379
Gly Asp Ile Leu His Gly Leu Pro Val Ser Ala Arg Leu Gly Arg Glu	
1000 1005 1010	
atc ctc ctt ggc cca gct gat ggc tac acc tcc aag ggg tgg aag ctt	3427
Ile Leu Leu Gly Pro Ala Asp Gly Tyr Thr Ser Lys Gly Trp Lys Leu	
1015 1020 1025	
ctc gcc ccc atc acc gct tac gcc cag cag aca cga ggt ctc ttg ggc	3475
Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly	
1030 1035 1040 1045	
tct ata gtg gtg agc atg acg ggg cgt gac aag aca gaa cag gcc ggg	3523
Ser Ile Val Val Ser Met Thr Gly Arg Asp Lys Thr Glu Gln Ala Gly	
1050 1055 1060	
gag gtc caa gtc ctg tcc aca gtc act cag tcc ttc ctc gga aca tcc	3571
Glu Val Gln Val Leu Ser Thr Val Thr Gln Ser Phe Leu Gly Thr Ser	
1065 1070 1075	
att tcg ggg gtc tta tgg act gtt tac cac gga gct ggc aac aag aca	3619
Ile Ser Gly Val Leu Trp Thr Val Tyr His Gly Ala Gly Asn Lys Thr	
1080 1085 1090	
cta gcc ggc tcg cgg ggc ccg gtc acg cag atg tac tcg agc gcc gag	3667
Leu Ala Gly Ser Arg Gly Pro Val Thr Gln Met Tyr Ser Ser Ala Glu	
1095 1100 1105	
ggg gac ttg gtc ggg tgg ccc agc cct cct ggg acc aaa tct ttg gag	3715
Gly Asp Leu Val Gly Trp Pro Ser Pro Pro Gly Thr Lys Ser Leu Glu	
1110 1115 1120 1125	
ccg tgt acg tgt gga gcg gtc gac ctg tat ttg gtc acg cgg aac gct	3763
Pro Cys Thr Cys Gly Ala Val Asp Leu Tyr Leu Val Thr Arg Asn Ala	
1130 1135 1140	
gat gtc atc ccg gct cga aga cgc ggg gac aag cgg gga gcg ctg ctc	3811
Asp Val Ile Pro Ala Arg Arg Arg Gly Asp Lys Arg Gly Ala Leu Leu	
1145 1150 1155	
tcc ccg aga ccc ctt tcg acc ttg aag ggg tcc tcg ggg gga cct gtg	3859
Ser Pro Arg Pro Leu Ser Thr Leu Lys Gly Ser Ser Gly Gly Pro Val	
1160 1165 1170	
ctt tgc cct agg ggc cac gct gtc gga atc ttc cgg gca gct gtg tgc	3907
Leu Cys Pro Arg Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys	
1175 1180 1185	

tct cgg ggt gtg gct aag tcc ata gat ttc atc ccc gtt gag acg ctc	3955
Ser Arg Gly Val Ala Lys Ser Ile Asp Phe Ile Pro Val Glu Thr Leu	
1190 1195 1200 1205	
gac atc gtc acg cgg tct ccc acc ttt agt gac aac agc aca cca cca	4003
Asp Ile Val Thr Arg Ser Pro Thr Phe Ser Asp Asn Ser Thr Pro Pro	
1210 1215 1220	
gct gtg ccc cag acc tat cag gtg ggg tac ttg cac gcc ccc act ggc	4051
Ala Val Pro Gln Thr Tyr Gln Val Gly Tyr Leu His Ala Pro Thr Gly	
1225 1230 1235	
agt gga aaa agc acc aag gtc ccc gtc gcg tac gcc gcc cag ggg tat	4099
Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr Ala Ala Gln Gly Tyr	
1240 1245 1250	
aaa gtg ctg gtg ctc aat ccc tcg gtg gct gcc acc ctg gga ttt ggg	4147
Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly	
1255 1260 1265	
gcg tac ttg tcc aag gca cat ggc atc aac ccc aac att agg act gga	4195
Ala Tyr Leu Ser Lys Ala His Gly Ile Asn Pro Asn Ile Arg Thr Gly	
1270 1275 1280 1285	
gtc aga act gtg acg acc ggg gag ccc att aca tac tcc acg tat ggt	4243
Val Arg Thr Val Thr Thr Gly Glu Pro Ile Thr Tyr Ser Thr Tyr Gly	
1290 1295 1300	
aaa ttc ctc gcc gat ggg ggc tgc gca ggc ggc gcc tat gac atc atc	4291
Lys Phe Leu Ala Asp Gly Gly Cys Ala Gly Gly Ala Tyr Asp Ile Ile	
1305 1310 1315	
ata tgc gat gaa tgc cac tct gtg gat gct acc act att ctc ggc atc	4339
Ile Cys Asp Glu Cys His Ser Val Asp Ala Thr Thr Ile Leu Gly Ile	
1320 1325 1330	
ggg aca gtc ctt gac caa gca gag aca gcc ggg gtc agg cta act gta	4387
Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Val Arg Leu Thr Val	
1335 1340 1345	
ctg gcc acg gcc acg ccc ccc ggg tcg gtg aca acc ccc cat ccc aat	4435
Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Thr Pro His Pro Asn	
1350 1355 1360 1365	
ata gag gag gta gcc ctc gga cag gag ggt gag atc ccc ttc tat ggg	4483
Ile Glu Glu Val Ala Leu Gly Gln Glu Gly Glu Ile Pro Phe Tyr Gly	
1370 1375 1380	
agg gcg ttt ccc ctg tct tac atc aag gga ggg agg cac ttg att ttc	4531
Arg Ala Phe Pro Leu Ser Tyr Ile Lys Gly Gly Arg His Leu Ile Phe	
1385 1390 1395	
tgc cac tca aag aaa aag tgt gac gag ctc gca acg gcc ctt cgg ggc	4579
Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala Thr Ala Leu Arg Gly	
1400 1405 1410	

atg ggc ttg aac gct gtg gca tat tac aga ggg ttg gac gtc tcc ata	4627
Met Gly Leu Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Ile	
1415 1420 1425	
ata cca act caa gga gat gtg gtg gtc gtt gcc acc gac gcc ctc atg	4675
Ile Pro Thr Gln Gly Asp Val Val Val Val Ala Thr Asp Ala Leu Met	
1430 1435 1440 1445	
acg ggg tat act gga gac ttt gac tcc gtg atc gac tgc aac gta gcg	4723
Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Val Ala	
1450 1455 1460	
gtc acc cag gcc gta gac ttc agc ctg gac ccc acc ttc act ata acc	4771
Val Thr Gln Ala Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Thr	
1465 1470 1475	
aca cag act gtc ccg caa gac gct gtc tca cgt agt cag cgc cga ggg	4819
Thr Gln Thr Val Pro Gln Asp Ala Val Ser Arg Ser Gln Arg Arg Gly	
1480 1485 1490	
cgc acg ggt aga gga aga ctg ggc att tat agg tat gtt tcc act ggt	4867
Arg Thr Gly Arg Gly Arg Leu Gly Ile Tyr Arg Tyr Val Ser Thr Gly	
1495 1500 1505	
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Glu Arg Ala Ser Gly Met Phe Asp Ser Val Val Leu Cys Glu Cys Tyr	
1510 1515 1520 1525	
gac gca gga gct gct tgg tat gag ctc tca cca gtg gag acg acc gtc	4963
Asp Ala Gly Ala Ala Trp Tyr Glu Leu Ser Pro Val Glu Thr Thr Val	
1530 1535 1540	
agg ctc agg gcg tat ttc aac acg cct ggc ttg cct gtg tgc cag gac	5011
Arg Leu Arg Ala Tyr Phe Asn Thr Pro Gly Leu Pro Val Cys Gln Asp	
1545 1550 1555	
cac ctt gag ttt tgg gag gca gtt ttc acc ggc ctc aca cac ata gac	5059
His Leu Glu Phe Trp Glu Ala Val Phe Thr Gly Leu Thr His Ile Asp	
1560 1565 1570	
gct cat ttc ctt tcc cag aca aag cag tcg ggg gaa aat ttc gca tac	5107
Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Ala Tyr	
1575 1580 1585	
tta gta gcc tat cag gcc aca gtg tgc gcc agg gcc aaa gcg ccc ccc	5155
Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Lys Ala Pro Pro	
1590 1595 1600 1605	
ccg tcc tgg gac gtc atg tgg aag tgc ttg act cga ctc aag ccc acg	5203
Pro Ser Trp Asp Val Met Trp Lys Cys Leu Thr Arg Leu Lys Pro Thr	
1610 1615 1620	
ctt gtg ggc cct aca cct ctc ctg tac cgt ttg ggc tct gtt acc aac	5251
Leu Val Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ser Val Thr Asn	
1625 1630 1635	

gag gtc acc ctt aca cac ccc gtg aca aaa tac atc gcc aca tgc atg	5299
Glu Val Thr Leu Thr His Pro Val Thr Lys Tyr Ile Ala Thr Cys Met	
1640 1645 1650	
caa gct gac ctc gag gtc atg acc agc acg tgg gtc ctg gct ggg gga	5347
Gln Ala Asp Leu Glu Val Met Thr Ser Thr Trp Val Leu Ala Gly Gly	
1655 1660 1665	
gtc tta gca gcc gtc gcc gcg tat tgc tta gcg acc ggg tgt gtt tcc	5395
Val Leu Ala Ala Val Ala Ala Tyr Cys Leu Ala Thr Gly Cys Val Ser	
1670 1675 1680 1685	
atc att ggc cgt tta cac atc aac cag cga gct gtc gtc gct ccg gac	5443
Ile Ile Gly Arg Leu His Ile Asn Gln Arg Ala Val Val Ala Pro Asp	
1690 1695 1700	
aag gag gtc ctc tat gag gct ttt gat gag atg gag gaa tgt gcc tcc	5491
Lys Glu Val Leu Tyr Glu Ala Phe Asp Glu Met Glu Glu Cys Ala Ser	
1705 1710 1715	
aga gcg gct ctc ctt gaa gag ggg cag cgg ata gcc gag atg ctg aag	5539
Arg Ala Ala Leu Leu Glu Glu Gly Gln Arg Ile Ala Glu Met Leu Lys	
1720 1725 1730	
tcc aag atc caa ggc tta ttg cag caa gcc tct aaa cag gcc cag gac	5587
Ser Lys Ile Gln Gly Leu Leu Gln Gln Ala Ser Lys Gln Ala Gln Asp	
1735 1740 1745	
ata caa ccc gct gtg caa gct tcg tgg ccc aag atg gag caa ttc tgg	5635
Ile Gln Pro Ala Val Gln Ala Ser Trp Pro Lys Met Glu Gln Phe Trp	
1750 1755 1760 1765	
gcc aaa cat atg tgg aac ttc ata agc ggc att cag tac ctc gca gga	5683
Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala Gly	
1770 1775 1780	
ctg tca aca ctg cca ggg aac cct gct gtg gct tcc atg atg gca ttc	5731
Leu Ser Thr Leu Pro Gly Asn Pro Ala Val Ala Ser Met Met Ala Phe	
1785 1790 1795	
agc gcc gcc ctc acc agt ccg ttg tca act agc acc acc atc ctt ctt	5779
Ser Ala Ala Leu Thr Ser Pro Leu Ser Thr Ser Thr Thr Ile Leu Leu	
1800 1805 1810	
aac att ctg ggg ggc tgg ctg gcg tcc caa att gcg cca ccc gcg ggg	5827
Asn Ile Leu Gly Gly Trp Leu Ala Ser Gln Ile Ala Pro Pro Ala Gly	
1815 1820 1825	
gcc act ggc ttt gtt gtc agt ggc ctg gtg gga gct gct gtt ggc agc	5875
Ala Thr Gly Phe Val Val Ser Gly Leu Val Gly Ala Ala Val Gly Ser	
1830 1835 1840 1845	
ata ggc ttg ggt aaa gtg ctg gtg gac atc ctg gca ggg tat ggt gcg	5923
Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr Gly Ala	
1850 1855 1860	
ggc att tcg ggg gcc ctc gtc gcg ttt aag atc atg tct ggc gag aag	5971

Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu Lys	
1865 1870 1875	
ccc tcc atg gag gat gtc atc aac ttg ctg cct ggg att ctg tct cca	6019
Pro Ser Met Glu Asp Val Ile Asn Leu Leu Pro Gly Ile Leu Ser Pro	
1880 1885 1890	
ggt gct ctg gtg gtg gga gtc atc tgc gcg gcc att ctg cgc cgc cat	6067
Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala Ile Leu Arg Arg His	
1895 1900 1905	
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Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile Ala	
1910 1915 1920 1925	
ttc gct tcc aga gga aac cac gtc gcc cct act cac tac gtg acg gag	6163
Phe Ala Ser Arg Gly Asn His Val Ala Pro Thr His Tyr Val Thr Glu	
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Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu Gly Ser Leu Thr Ile	
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Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile Thr Glu Asp Cys Pro	
1960 1965 1970	
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Ile Pro Cys Ala Gly Ser Trp Leu Arg Asp Val Trp Asp Trp Val Cys	
1975 1980 1985	
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Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr Ser Lys Leu Phe Pro	
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Lys Met Pro Gly Leu Pro Phe Ile Ser Cys Gln Lys Gly Tyr Lys Gly	
2010 2015 2020	
gtg tgg gcc ggc act ggc atc atg acc aca cga tgc ccc tgc ggc gcc	6451
Val Trp Ala Gly Thr Gly Ile Met Thr Thr Arg Cys Pro Cys Gly Ala	
2025 2030 2035	
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Asn Ile Ser Gly Asn Val Arg Leu Gly Ser Met Arg Ile Thr Gly Pro	
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aaa acc tgc atg aac acc tgg cag ggg acc ttt cct atc aat tgt tat	6547
Lys Thr Cys Met Asn Thr Trp Gln Gly Thr Phe Pro Ile Asn Cys Tyr	
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aca gaa ggc cag tgc ttg ccg aaa ccc gcg tta aac ttc aag acc gcc	6595
Thr Glu Gly Gln Cys Leu Pro Lys Pro Ala Leu Asn Phe Lys Thr Ala	
2070 2075 2080 2085	
atc tgg aga gtg gcg gcc tca gag tac gcg gaa gtg acg cag cac gga	6643

Ile Trp Arg Val Ala Ala Ser Glu Tyr Ala Glu Val Thr Gln His Gly	
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tca tat gcc tat ata aca ggg ctg acc act gac aac tta aaa gtc cct	6691
Ser Tyr Ala Tyr Ile Thr Gly Leu Thr Thr Asp Asn Leu Lys Val Pro	
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Cys Gln Leu Pro Ser Pro Glu Phe Phe Ser Trp Val Asp Gly Val Gln	
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Ile His Arg Ser Ala Pro Thr Pro Lys Pro Phe Phe Arg Asp Glu Val	
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Ser Phe Ser Val Gly Leu Asn Ser Phe Val Val Gly Ser Gln Leu Pro	
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tgt gac cct gag ccc gac act gag gta gtg atg tcc atg cta aca gac	6883
Cys Asp Pro Glu Pro Asp Thr Glu Val Val Met Ser Met Leu Thr Asp	
2170 2175 2180	
cca tcc cat atc acg gcg gag gct gca gcg cgg cgt tta gcg cgg ggg	6931
Pro Ser His Ile Thr Ala Glu Ala Ala Ala Arg Arg Leu Ala Arg Gly	
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Ser Pro Pro Ser Glu Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala Pro	
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Ser Leu Arg Ala Thr Cys Thr Thr His Gly Arg Thr Tyr Asp Val Asp	
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Met Val Asp Ala Asn Leu Phe Met Gly Gly Gly Val Ile Arg Ile Glu	
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Ser Glu Ser Lys Val Val Val Leu Asp Ser Leu Asp Ser Met Thr Glu	
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Glu Glu Gly Asp Leu Glu Pro Ser Val Pro Ser Glu Tyr Met Leu Pro	
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Arg Lys Arg Phe Pro Pro Ala Leu Pro Ala Trp Ala Arg Pro Asp Tyr	
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Asn Pro Pro Leu Val Glu Ser Trp Lys Arg Pro Asp Tyr Gln Pro Pro	
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Thr Val Ala Gly Cys Ala Leu Pro Pro Pro Lys Lys Thr Pro Thr Pro	

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Pro Pro Arg Arg Arg Arg Thr Val Gly Leu Ser Glu Ser Thr Ile Gly	2330	2335	2340	
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Asp Ala Leu Gln Gln Leu Ala Ile Lys Ser Phe Gly Gln Pro Pro Pro	2345	2350	2355	
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Ser Gly Asp Ser Gly Leu Ser Thr Gly Ala Asp Ala Ala Asp Ser Gly	2360	2365	2370	
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Asp Arg Thr Pro Pro Asp Glu Leu Ala Leu Ser Glu Thr Gly Ser Thr	2375	2380	2385	
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Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Glu	2390	2395	2400	2405
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Pro Glu Gln Val Glu Leu Gln Pro Pro Pro Gln Gly Gly Glu Ala Ala	2410	2415	2420	
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Pro Gly Ser Asp Ser Gly Ser Trp Ser Thr Cys Ser Glu Glu Asp Asp	2425	2430	2435	
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Ser Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Ile	2440	2445	2450	
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Thr Pro Cys Ser Pro Glu Glu Glu Lys Leu Pro Ile Asn Ser Leu Ser	2455	2460	2465	
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Asn Ser Leu Leu Arg Tyr His Asn Lys Val Tyr Cys Thr Thr Ser Lys	2470	2475	2480	2485
agt gcc tca cta agg gct aaa aag gta act ttt gat agg atg caa gtg				7843
Ser Ala Ser Leu Arg Ala Lys Lys Val Thr Phe Asp Arg Met Gln Val	2490	2495	2500	
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Leu Asp Ala Tyr Tyr Asp Ser Val Leu Lys Asp Ile Lys Leu Ala Ala	2505	2510	2515	
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Lys	Met	Ala	Leu	Tyr	Asp	Val	Thr	Gln	Lys	Leu	Pro	Gln	Ala	Val	Met	
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Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	Thr	Glu	Arg	Asp	Ile	Arg	Thr	
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Ala	Ile	His	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Val	Gly	Gly	Pro	Met	Phe	
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Val	Leu	Thr	Thr	Ser	Met	Gly	Asn	Thr	Ile	Thr	Cys	Tyr	Val	Lys	Ala	
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Leu Pro Ala Arg
3030

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Thr Arg Lys Ala Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
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Ile Pro Lys His Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly
65 70 75 80
Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp
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Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro
100 105 110
Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys
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130 135 140
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Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Val
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Gln Val Lys Asn Thr Ser Asn Ala Tyr Met Ala Thr Asn Asp Cys Ser
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Asn Asp Ser Ile Thr Trp Gln Leu Glu Ala Ala Val Leu His Val Pro
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Pro	Lys	Cys	Leu	Val	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys		
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Trp	Leu	Cys	Tyr	Leu	Leu	Thr	Leu	Ala	Glu	Thr	Met	Val	Gln	Glu	Trp	850	855	860	
Ala	Pro	Ser	Met	Gln	Ala	Arg	Gly	Gly	Arg	Asp	Gly	Ile	Ile	Trp	Ala	865	870	875	880
Ala	Thr	Ile	Phe	Cys	Pro	Gly	Val	Val	Phe	Asp	Ile	Thr	Lys	Trp	Leu	885	890	895	
Leu	Ala	Val	Leu	Gly	Pro	Gly	Tyr	Leu	Leu	Arg	Gly	Ala	Leu	Thr	Arg				
			900					905					910						
Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Ala	Leu	Leu	Arg	Met	Cys	Thr	Met	915	920	925	
Val	Arg	His	Leu	Ala	Gly	Gly	Arg	Tyr	Val	Gln	Met	Ala	Leu	Leu	Ala	930	935	940	
Leu	Gly	Arg	Trp	Thr	Gly	Thr	Tyr	Ile	Tyr	Asp	His	Leu	Thr	Pro	Met	945	950	955	960
Ser	Asp	Trp	Ala	Ala	Ser	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	965	970	975	
Pro	Ile	Ile	Phe	Ser	Pro	Met	Glu	Lys	Lys	Val	Ile	Val	Trp	Gly	Ala	980	985	990	
Glu	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Leu	His	Gly	Leu	Pro	Val	Ser	Ala	995	1000	1005	
Arg	Leu	Gly	Arg	Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Tyr	Thr	Ser	1010	1015	1020	
Lys	Gly	Trp	Lys	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	1025	1030	1035	1040
Arg	Gly	Leu	Leu	Gly	Ser	Ile	Val	Val	Ser	Met	Thr	Gly	Arg	Asp	Lys	1045	1050	1055	
Thr	Glu	Gln	Ala	Gly	Glu	Val	Gln	Val	Leu	Ser	Thr	Val	Thr	Gln	Ser	1060	1065	1070	
Phe	Leu	Gly	Thr	Ser	Ile	Ser	Gly	Val	Leu	Trp	Thr	Val	Tyr	His	Gly	1075	1080	1085	
Ala	Gly	Asn	Lys	Thr	Leu	Ala	Gly	Ser	Arg	Gly	Pro	Val	Thr	Gln	Met	1090	1095	1100	
Tyr	Ser	Ser	Ala	Glu	Gly	Asp	Leu	Val	Gly	Trp	Pro	Ser	Pro	Pro	Gly	1105	1110	1115	1120
Thr	Lys	Ser	Leu	Glu	Pro	Cys	Thr	Cys	Gly	Ala	Val	Asp	Leu	Tyr	Leu	1125	1130	1135	
Val	Thr	Arg	Asn	Ala	Asp	Val	Ile	Pro	Ala	Arg	Arg	Arg	Gly	Asp	Lys	1140	1145	1150	

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 Ala Lys Ala Pro Pro Pro Ser Trp Asp Val Met Trp Lys Cys Leu Thr

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 2130 2135 2140
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Cys Tyr Val Lys Ala Leu Ala Ala Cys Lys Ala Ala Gly Ile Ile Ala		
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Pro Thr Met Leu Val Cys Gly Asp Leu Val Val Ile Ser Glu Ser		
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Ser Pro Leu Asp Leu Pro Ala Ile Ile Glu Arg Leu His Gly Leu Asp		
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Ala Phe Ser Leu His Thr Tyr Thr Pro His Glu Leu Thr Arg Val Ala		
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Ser Ala Leu Arg Lys Leu Gly Ala Pro Pro Leu Arg Ala Trp Lys Ser		
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Ala Val Cys Gly Arg Tyr Leu Phe Asn Trp Ala Val Lys Thr Lys Leu		2960

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ccccucuccg	ggagagccau	aguggucugc	ggaaccggug	aguacaccgg	aauggccggg	180
aagacugggu	ccuuucuuug	auaaacccac	ucuaugcccg	gccauuuggg	cgugcccccg	240
caagacugcu	agccgaguag	cguuggguug	cgaaaggccu	ugugguacug	ccugauaggg	300
cgcuugcgag	ugccccggga	ggucucguag	accgugcacc			340

<210> 10

<211> 340

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic RNA

<400> 10

accgcgcccc	aaugggggcg	acacuccgcc	augaauacacu	ccccugugag	gaacuacugu	60
cuucacgcag	aaagcgucua	gccauggcgu	uaguaugagu	gucguacagc	cuccaggccc	120
ccccucuccg	ggagagccau	aguggucugc	ggaaccggug	aguacaccgg	aauggccggg	180
aagacugggu	ccuuucuuug	auaaacccac	ucuaugcccg	gccauuuggg	cgugcccccg	240
caagacugcu	agccgaguag	cguuggguug	cgaaaggccu	ugugguacug	ccugauaggg	300
ugcuugcgag	ugccccggga	ggucucguag	accgugcacc			340

<210> 11

<211> 236

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic RNA

<400> 11

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agcggcacac acuagguaca cuccauagcu aacuguuccu uuuuuuuuuu uuuuuuuuuu 60
uuuuuuuuuu uuuuuuuuuu uucuuuuuuu uuuuuuuucc uuuuuuuucc cuucucaucu 120
uauucuacuu ucuuuucuugg uggucccauc uuagcccuag ucacggcuag cugugaaagg 180
uccgugagcc gcaugacugc agagagugcc guaacugguc ucucugcaga ucaugu      236
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<210> 12

<211> 232

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic RNA

<400> 12

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agcggcacac auuagcuaca cuccauagcu aacuguuccu uuuuuuuuuu uuuuuuuuuu 60
uuuuuuuuuu uuuuuuuuuu uuuuuuuuuu uuucccucu ucuucccuuc ucaucuauu 120
cuacuuucuu ucuugguggc uccaucuuag ccugggucac ggcugagcugu gaaagguccg 180
ugagccgcau gacugcagag agugccguaa cuggucucuc ugcagaucau gu      232
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<210> 13

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 13

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cgggagagcc atagtgg 17
```

<210> 14

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 14

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agtaccacaa ggcctttcg 19
```

<210> 15

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 15

ctgcggaacc ggtgagtaca c 21

<210> 16
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 16
 aacaagatgg attgcacgca 20

<210> 17
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 17
 cgtcaagaag gcgatagaag 20

<210> 18
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 18
 gcactctctg cagtcatgcg gctcacggac 30

<210> 19
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 19
 cccctgtgag gaactactgt cttcacgc 28

<210> 20
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 20
 ccgggagagc catagtgggc tgcg 24

<210> 21
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 21
 ccactcaaag aaaaagtgtg acgagctcgc 30

<210> 22
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 22
 ggcttgggca cggcctga 18

<210> 23
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 23
 gcggtgaaga ccaagctcaa actcactcca 30

<210> 24
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 24
 agaacctgcg tgcaatccat c 21

<210> 25
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 25
 cccgtcatga gggcgtcggt ggc 23

 <210> 26
 <211> 27
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 26
 accagcaacg gtgggcggtt ggtaatc 27

 <210> 27
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 27
 ggcacgcgac acgctgtg 18

 <210> 28
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 28
 agctagccgt gactagggct aagatggagc 30

 <210> 29
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic
 DNA(primer)

 <400> 29
 aacaagatgg attgcacgca 20

<210> 30
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic
 DNA(primer)

 <400> 30
 cgtcaagaag gcgatagaag 20

 <210> 31
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 31
 gcactctctg cagtcatgcg gctcacggac 30

 <210> 32
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 32
 cccctgtgag gaactactgt cttcacgc 28

 <210> 33
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

 <400> 33
 ccgggagagc catagtgggc tgcg 24

 <210> 34
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 34
 ccactcaaag aaaaagtgtg acgagctcgc 30

<210> 35
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic
 DNA(primer)

<400> 35
 ggcttgggca cggcctga 18

<210> 36
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 36
 gcggtgaaga ccaagctcaa actcactcca 30

<210> 37
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 37
 agaacctgcg tgcaatccat c 21

<210> 38
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: synthetic DNA

<400> 38
 cccgtcatga gggcgtcgtt ggc 23

<210> 39
 <211> 27
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 39

accagcaacg gtgggcggtt ggtaatc

27

<210> 40

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 40

ggaacgcgac acgctgtg

18

<210> 41

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 41

agctagccgt gactagggct aagatggagc

30